

INSTALLATION RESTORATION PROGRAM

Decision Document for Soil and Groundwater at the Storage Area at the USMC Subleased Area, Site 3

144TH FIGHTER WING
CALIFORNIA AIR NATIONAL GUARD
FRESNO AIR TERMINAL, FRESNO, CALIFORNIA

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REPORT DOCUMENTATION PAGE

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1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE January 1996	3. REPORT TYPE AND DATES COVERED No Further Action Decision Document	
4. TITLE AND SUBTITLE Decision Document for IRP Site No. 3, California Air National Guard, 144th Fighter Wing, Fresno Air Terminal, Fresno, California			5. FUNDING NUMBERS	
6. AUTHOR(S) NA				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) IT Corporation 312 Directors Drive Knoxville, Tennessee 37923			8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) HAZWRAP/Martin Marietta Energy Systems, Inc. for ANG/CEVR 3500 Fetchet Avenue Andrews AFB MD 20762-5157			10. SPONSORING/MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES				
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution is unlimited			12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) Decision Document for IRP Site No. 3- Storage Area at the USMC Sublease Area, California Air National Guard, 144th Fighter Wing, Fresno Air Terminal, Fresno, California. This report documents the data, conclusion, and recommendation to support a No Further Remedial Action Planned decision at Site 3 under the IRP.				
14. SUBJECT TERMS Installation Restoration Program; Comprehensive Environmental Response, Compensation and Liability Act (CERCLA); Air National Guard; Site Investigation, California Air National Guard; Fresno, California			15. NUMBER OF PAGES 30	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT None	

**Draft Decision Document
for Soil and Groundwater at the Storage Area at the
USMC Subleased Area, Site 3
144th Fighter Wing, California Air National Guard
Fresno Air Terminal
Fresno, California**

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Contract DE-AC05-840R21400**

January 1996

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Table of Contents

Page

1.0	Introduction	1-1
1.1	Purpose	1-1
1.2	Location	1-1
1.3	Environmental Setting	1-2
1.3.1	Climate	1-2
1.3.2	Geology	1-2
1.3.3	Hydrogeology	1-3
2.0	Background	2-1
2.1	Site History	2-1
2.2	Investigation Results	2-2
2.2.1	SOV Survey Results	2-2
2.2.2	Soil Sampling Results	2-2
2.2.3	Groundwater Sampling Results	2-3
2.3	Risk Assessment	2-4
2.3.1	Risks Associated with Site Soils	2-4
2.3.2	Risks Associated with Site Groundwater	2-4
3.0	Conclusions	3-1
4.0	Recommendations	4-1
5.0	References	5-1

List of Figures

Figure	Title	Follows Page
1	Base Map location of identified investigation sites	1-1
2	Soil boring and monitoring well locations at Site No. 3	2-1
3	Environmental sampling locations at Site No. 3	2-2

1.0 Introduction

This decision document (DD) for Site 3 - the Storage Area at the U.S. Marine Corps (USMC) Subleased Area at the California Air National Guard (ANG) Base, Fresno, California (the Base), is being submitted under the requirements of the Department of Defense Installation Restoration Program (IRP) and the Comprehensive Environmental Response, Compensation and Liability Act, as amended by Superfund Amendments and Reauthorization Act.

1.1 Purpose

The objective of this DD is to provide technical rationale to support no further action at Site 3. Implementation of this recommended alternative would preclude any future remedial investigation/feasibility study (RI/FS) activities at the site.

Site 3 has been determined to pose no significant threat to public health or the surrounding environment based on evaluations of possible source areas, sampling data, pathways and contaminant receptors. The information presented herein is a synopsis of activities and results of various stages of investigative work. Detailed evidence on which the decision for no further action is based can be found in its entirety in the Site Investigation Report, (IT Corporation [IT], 1992), the Quarterly Groundwater Monitoring Report, April 1993, (IT, 1993) and the Remedial Investigation Report, (IT, 1996).

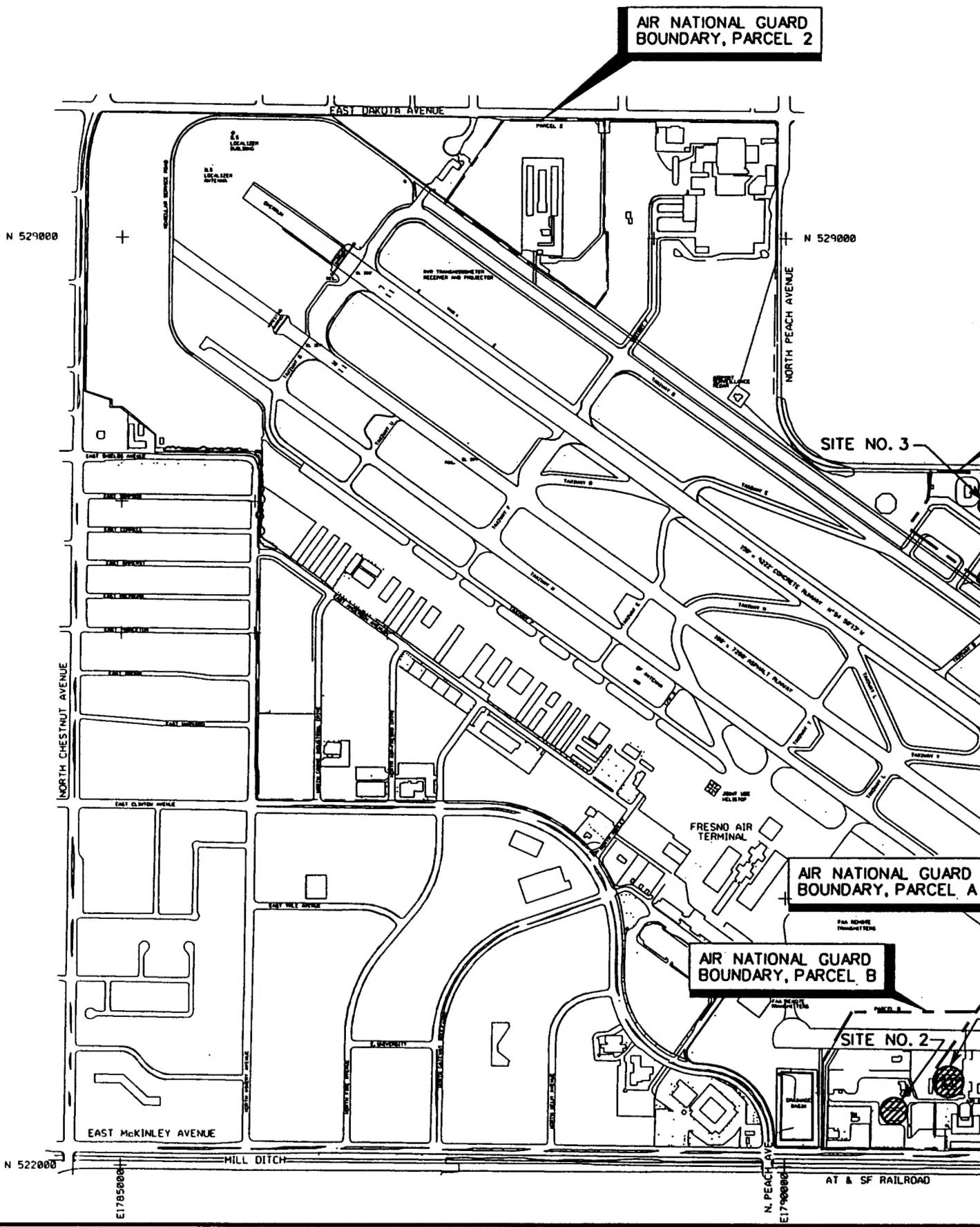
1.2 Location

The California ANG leases approximately 140 acres of land from the City of Fresno on three different parcels inside the Fresno Air Terminal boundaries (Figure 1). Site 3 is within one of the northern parcels of land which the ANG subsequently leases to the USMC (Reserve) 4th Light Antiaircraft Motorized Battalion. The location of Site 3 at the Fresno Air Terminal is shown in Figure 1.

1.3 Environmental Setting

To better understand the rationale for the no-further-action decision at Site 3, the following paragraphs describe the environmental setting and possible migration potential in the vicinity of the site.

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LEGEND:



PROPERTY BOUNDARY

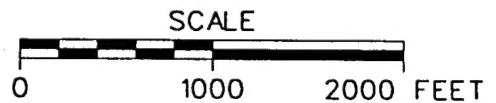
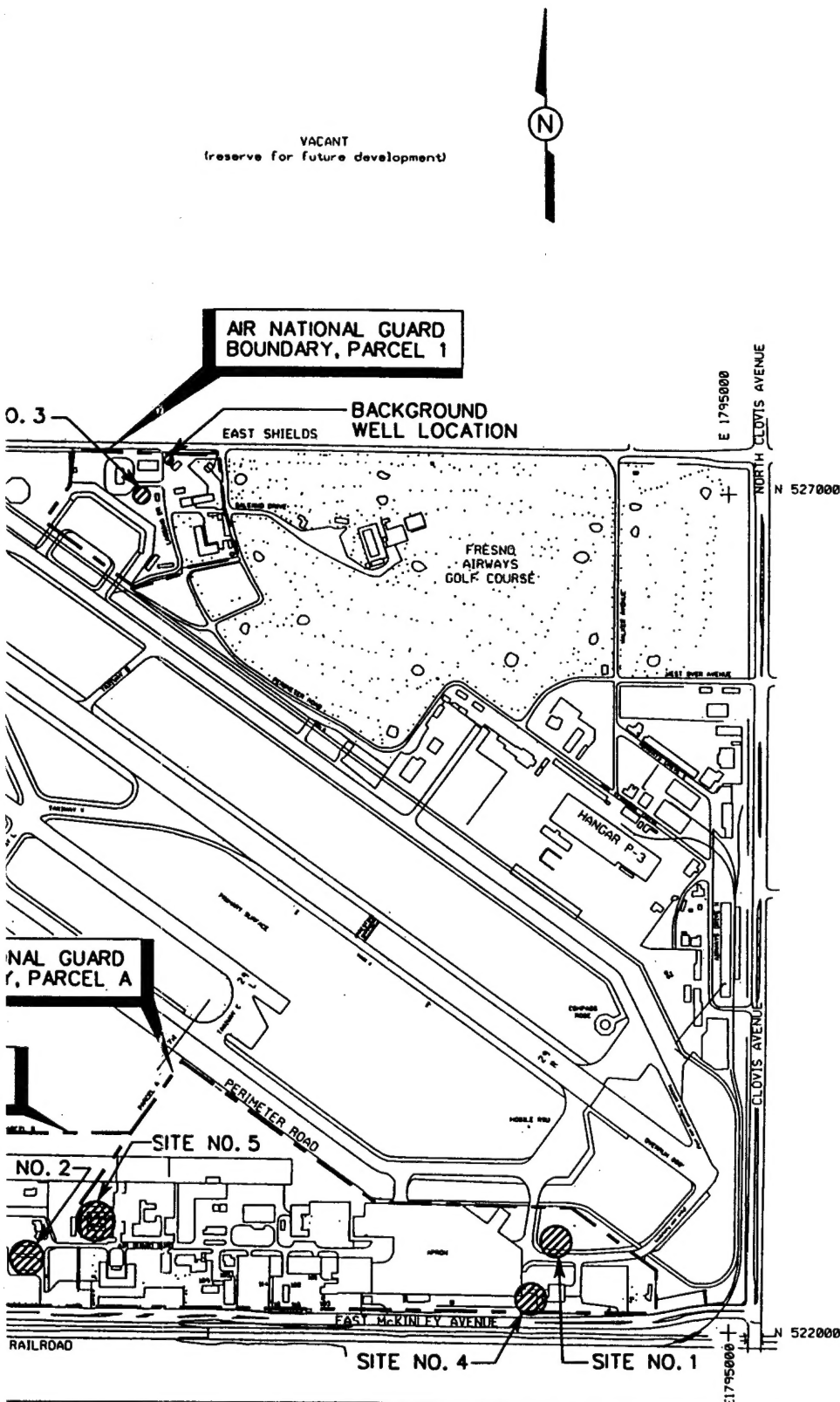


FIGURE 1
BASE MAP LOCATION OF
IDENTIFIED INVESTIGATION SITES

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FRESNO AIR TERMINAL
FRESNO, CALIFORNIA



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CORPORATION

3

LEGEND:

— — — — — PROPERTY BOUNDARY


SCALE

1000 2000 FEET

FIGURE 1
BASE MAP LOCATION OF
IDENTIFIED INVESTIGATION SITES

CALIFORNIA AIR NATIONAL GUARD
RESNO AIR TERMINAL
RESNO, CALIFORNIA

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CORPORATION

1.3.1 Climate

The climate is characterized by hot, dry summers and cool, moist winters. Mean monthly temperatures range from 46°F in December to 85°F in July. Winds are generally from the northwest. The average annual precipitation is less than 10 inches in the Fresno area. More than 90 percent of the yearly precipitation occurs between October and April. Yearly rainfall varies widely from year to year and shows long-term wet and dry periods. The mean evaporation rate is 66 inches per year.

1.3.2 Geology

Fresno is situated in the Central Valley province of California. The valley is a large, elongated, northwest trending, asymmetric structural trough that is bounded on the east by the Sierra Nevada and on the west by the Coast Ranges. Fresno is located in the eastern San Joaquin Valley on sedimentary deposits characterized by a mixture of poorly sorted clay, silt, sands, and gravels with some beds of claystone, siltstone, sandstone, and a conglomerate of Quaternary and Pliocene ages. The unconsolidated deposits generally extend to depths of 1,000 feet or more.

At the Base, the geology is characterized by alluvial fan deposits (Cehrs et al., 1979). The fans have a low surface relief with very gentle gradients. Deposits in these fans are associated with an alluvial flood plain regime. Sediments in the fans range from clays to gravel, with finer sediments (silts and clays) associated with overbank and flood plain deposits, and coarser sediments (sands and gravels) associated with levee, crevasse splay, channel lag, and point bar deposits.

Alluvial fan deposits are heterogeneous both vertically and laterally. Alluvial fans proximal to the site exhibit a wide variety of depositional processes. The alluvial deposits are variable both lateral and vertical with multiple source areas from shifting streams that transport, distribute, and deposit sediments (Cehrs et al., 1979). Therefore, beds beneath the general site are very localized in extent.

1.3.3 Hydrogeology

In the Fresno area, all municipal and rural domestic water is pumped from the alluvial aquifers. The aquifer system has been described as unconfined or semiconfined depending on local hydrogeologic conditions (Cehrs et al., 1979; Steele, 1986). The water table beneath the Base is approximately 80 feet below ground surface; groundwater flows to the southwest (IT, 1996).

Groundwater flow through the alluvial sediments comprising the aquifer system beneath the Fresno area is controlled by the slope of the water table (to the southwest) and the occurrence of coarse-grained sediments within the alluvial fans. Coarse-grained sediments within fan deposits generally occur in northeast-southwest trending elongated sand bodies resulting from deposition in ephemeral stream channels that have shifted through time (Cehrs et al., 1979). Thus, in the Fresno area groundwater flows generally to the southwest and preferentially through coarse-grained channel deposits.

2.0 Background

The Air National Guard Readiness Center (ANGRC) instituted a comprehensive IRP to assess the extent of suspected chemical contamination that may have resulted from past handling and disposal practices at the Base. The ANGRC designed the IRP to generate data of sufficient quality during a site investigation (SI) that will support one or more of the following recommendations:

- Generate a DD recommending no further action
- Initiate a focused feasibility study/remedial measure
- Implement a remedial response
- Initiate a RI/FS.

Results of the investigation programs at Site 3 indicate that no further action is warranted at this site. General supporting information is presented in the following sections.

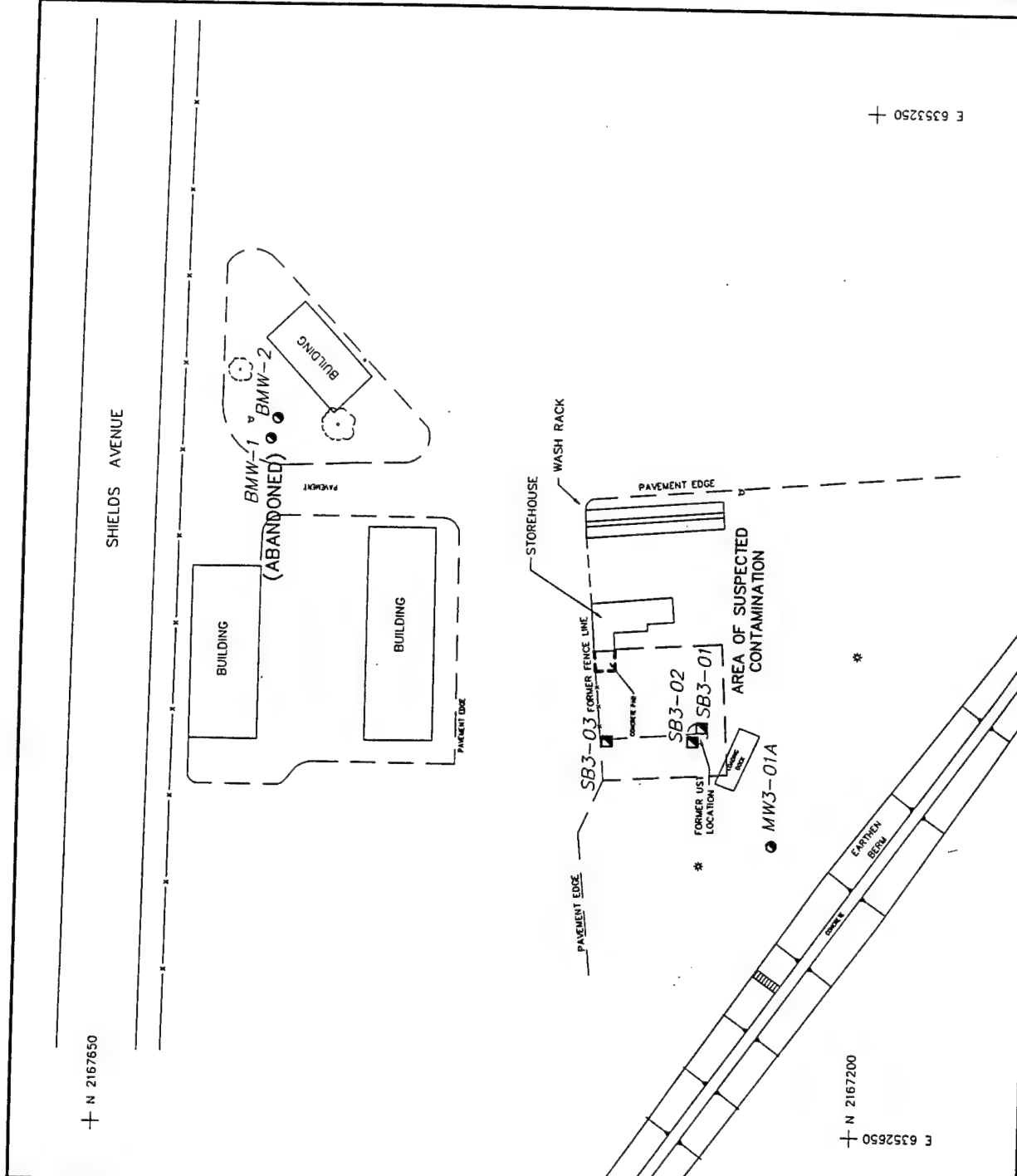
2.1 Site History

In April 1988, a preliminary assessment (PA) was completed by the Hazardous Materials Technical Center focusing on past and present generation, use, handling and disposal practices of hazardous wastes and materials. Based on HMTTC's findings, three suspect sites potentially contaminated with hazardous waste/materials were identified and recommended for further IRP investigation. The storage area at the USMC Sublease Area was identified as a site for further investigation and was included as Site 3.

Site 3 was an abandoned waste petroleum, oil and lubricants (POL) storage area where products may have leaked or spilled onto the ground during handling, transfer and storage to an underground waster oil storage tank. The USMC uses the subleased area primarily for vehicular and aerospace ground equipment maintenance.

During a site survey conducted as part of the PA, soil staining was observed along a fence line that previously surrounded the storage area. The stain was believed to have resulted from waste POL that had leaked from temporary storage drums on site. It was estimated that less than 100 gallons of waste oil has leaked onto the ground.

Waste POL were transferred from the POL racks to an underground storage tank (UST) located at the end of the fence line (Figure 2). In mid-1988, the fence line, storage area and UST were removed and relocated, along with any evidence of soil staining as reported in the



LEGEND:

- SB3-01 SOIL BORING
- BMW-1 BACKGROUND MONITORING WELL
- MW3-01A MONITORING WELL
- ⊛ LIGHT POLE
- ⊙ FIRE HYDRANT
- FENCE LINE
- ⊕ TREE

SCALE:
 0 60 120 FEET

FIGURE 2
 SOIL BORING & MONITORING WELL
 LOCATIONS AT SITE NO. 3

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PA. The UST was removed and relocated as an aboveground tank in a concrete-lined sump in a new storage area.

In 1990, an SI was conducted to confirm or deny the presence of contamination, to identify the presence and concentrations of specific chemical contaminants in both soil and in the uppermost water-bearing unit and to assess geologic, hydrogeologic and geochemical conditions at Site 3. As a part of the SI, 18 soil organic vapor (SOV) points were placed along two lines: one east-west along the former fence line where soil staining had been reported at its base, and one north-south across the former UST location. Three soil samples were drilled, from which 13 soil samples were collected and analyzed for total petroleum hydrocarbon (TPH) (diesel fractions only), volatile organic compounds (VOC) and semivolatile organic compounds (SVOC). One initial boring was drilled at a predesignated location along the former fence line due to a lack of contamination detected from the SOV survey and two borings were drilled at depths targeting potential leaks in the area of the former UST. Data from 2 piezometers installed at Site 3 were combined with data from the Base-specific background monitoring well to determine the direction of groundwater flow. A single monitoring well was installed directly downgradient of Site 3 to monitor groundwater quality. Five groundwater samples were collected from this well over a period from November 1990 to April 1993.

2.2 Investigation Results

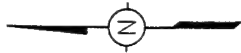
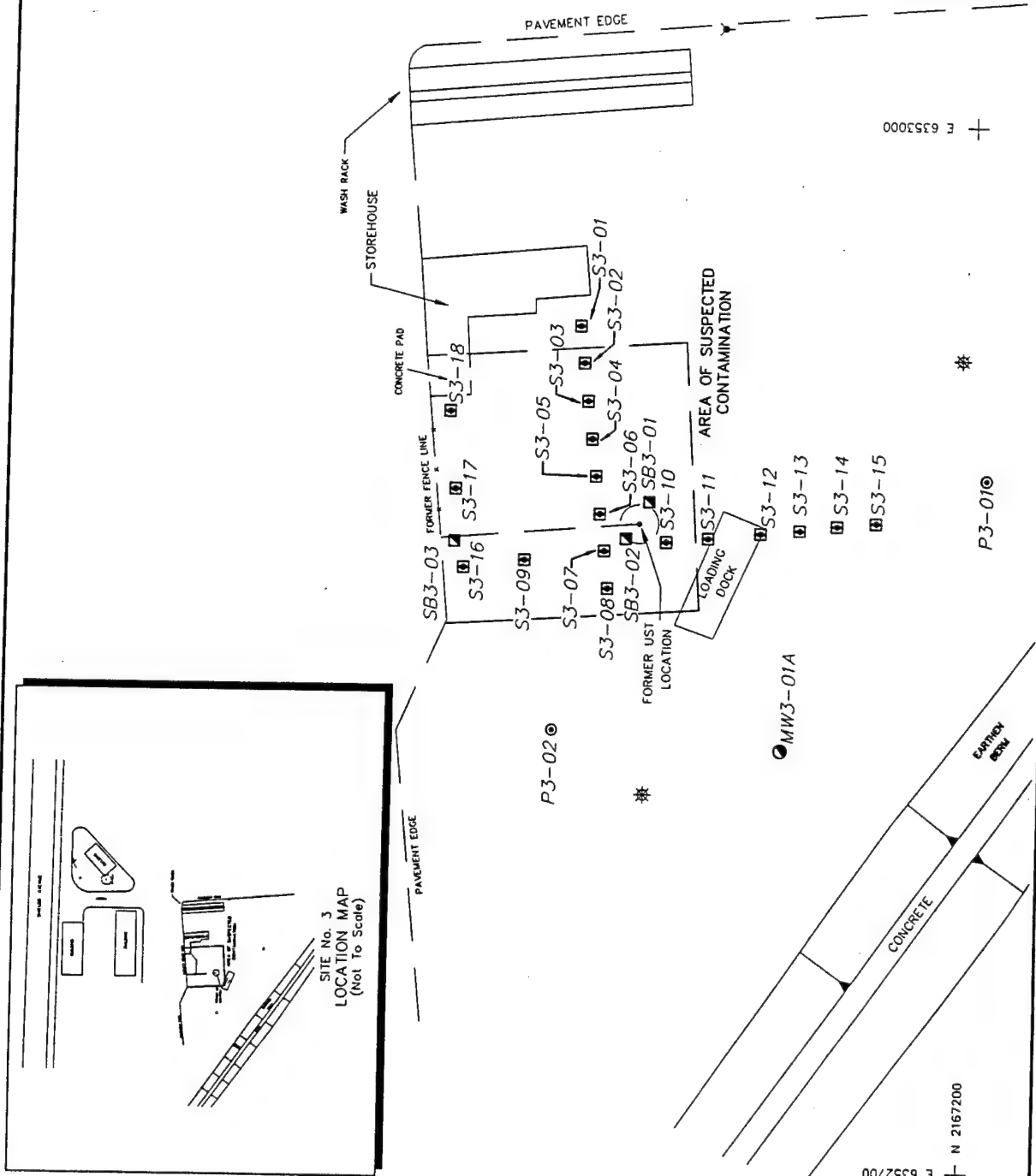
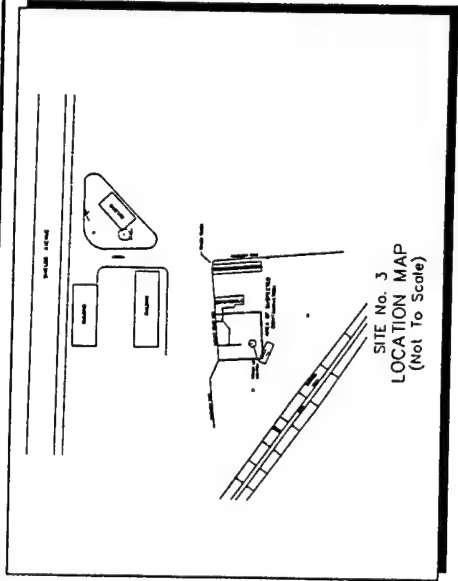
Rationale and methodologies for the investigation activities were developed in the SI sampling and analysis plan (SAP) for the Base. Figure 3 shows the placement of the SOV points, soil borings and monitoring well. Comprehensive investigation information and results are incorporated in the SI Report (IT, 1992). Additional data summaries are presented in Appendix I of the Remedial Investigation report (IT, 1996).

2.2.1 SOV Survey Results

Soil gas samples were analyzed for volatile fuel components and a selected list of chlorinated solvents. Eighteen SOV points were driven and sampled along the lines of suspected contamination, as shown in Figure 3. Neither halocarbons nor volatile petroleum hydrocarbons were detected above the level of significance at Site 3.

2.2.2 Soil Sampling Results

Three soil borings were drilled at Site 3 (SB3-01, SB3-02, and SB3-03) and a total of 13 samples (excluding quality control samples) were collected. The initial boring, SB3-03, was



LEGEND:

- SB3-03 SOIL BORING
- ⊙ P3-01 PIEZOMETER
- ⊠ S3-10 SOIL GAS SAMPLE
- MW3-01A MONITORING WELL

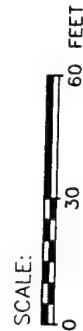


FIGURE 3
 ENVIRONMENTAL SAMPLING
 LOCATIONS AT SITE NO. 3

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drilled as a predesignated location marked in the SAP due to a lack of findings with the SOV survey. Nine soil samples were collected from this boring to a total depth of 55 feet. Sample collection in the two subsequent borings (SB3-01 and SB3-02) was targeted at depths ranging from 16 to 19 feet to investigate possible leaks at the depth of the abandoned UST holding pit. Soil samples were analyzed for TPH (diesel), VOC and SVOC. Boring locations are shown in Figures 2 and 3.

Of the samples collected at Site 3, acetone was the only volatile compound reported. Acetone was quantified at estimated concentrations in seven samples with a maximum concentration of 9 micrograms per kilogram ($\mu\text{g/kg}$). However, in each sample, acetone was also detected in the associated laboratory method blank. All of the detections are considered to be caused by laboratory contamination and not site conditions.

Bis(2-ethylhexyl)phthalate, a SVOC, was detected in one sample at a depth of 1 to 2.5 feet at an estimated concentration of 92 $\mu\text{g/kg}$. No other SVOCs were reported.

TPH was not detected in any of the soil samples.

2.2.3 Groundwater Sampling Results

Two piezometers were installed during the field screening stages of the SI. Groundwater elevations were measured in these piezometers and in the nearby Base-specific background monitoring well to provide information on groundwater flow direction beneath the site. Groundwater flow was determined to be from the northeast towards the southwest. Considering the small physical size of Site 3, a single monitoring well (MW3-01A) was installed hydrogeologically downgradient of the site.

Monitoring well MW3-01A was installed to monitor groundwater quality from the uppermost water-bearing unit. A Base-specific background well (BMW-1, and later its replacement, BMW-2) functioned as the upgradient well for this site. Five groundwater samples were collected over the monitoring history. Samples were collected in November 1990, February 1991, October 1992, January 1993 and April 1993.

Over the first three events, samples were analyzed for VOC, SVOC and TPH (as diesel). Due to a lack of positive detections, the well was sampled only for VOC during the last two sampling rounds and were analyzed primarily to provide information concerning more widespread groundwater contamination across the Fresno Air Terminal.

The sample collected in 1990 reported a SVOC, chrysene, at an estimated concentration of 6 micrograms per liter ($\mu\text{g/L}$), which was less than the quantitation limit of 10 $\mu\text{g/L}$. Chrysene was also reported in the sample from the background well for this sampling event. All other SVOC and VOC that were analyzed were not detected.

No VOC were detected in any of the groundwater samples collected over the span of the project. No SVOC were detected in the February 1991 or October 1992 rounds; this analysis was eliminated from the analytical suite during the last two sampling rounds. No TPH (as diesel) was detected in any of the first three samples collected, and its analysis was dropped during the final two rounds due to a lack of detections.

2.3 Risk Assessment

A baseline risk assessment was conducted to quantify the risk to human receptors that may occur at Site 3 under various scenarios if no remedial actions are taken. A summary of findings from this evaluation are included in the following sections. Risks of exposure to chemicals of concern identified in Site 3 media were quantified for existing and predicted land use conditions. Exposure pathways evaluated for soils included incidental soil ingestion, dermal contact with soil, and inhalation of dust from surface soils. For groundwater, exposure routes included ingestion, dermal contact and inhalation of volatiles during household water use. A complete explanation of risk evaluation methods and selection of chemicals of concern is included in the RI Report (IT, 1996).

2.3.1 Risks Associated with Site Soils

A cumulative sum of the cancer and noncancer risks for the identified exposure pathways and chemicals detected at Site 3 exhibit risks below the target cancer range of 10^{-6} to 10^{-4} , and noncancer risks below the hazard index target of one.

A simplistic leaching model was also used to conservatively estimate potential impacts to groundwater from organic contaminants in soil. No chemicals found in the soil at Site 3 was found to have the potential to leach to groundwater and be present at concentrations above the regulatory maximum contaminant level for groundwater.

2.3.2 Risks Associated with Site Groundwater

Exposure risks for groundwater were evaluated for both those chemicals detected in Site 3 groundwater and for chemicals that may leach from the overlying soil. All cancer risk estimates for each exposure scenario were below the target risk range of 10^{-6} to 10^{-4} . Risk

for ingestion of groundwater at the site were at the low end of the target range (chrysene ingestion risk = 2.2×10^{-6}). No on-site receptor is above the total cancer risk across pathways or exceeded the upper limit of the target range (10^{-4}).

Chrysene was only detected at a low concentration in one of three groundwater samples collected at Site 3. Chrysene was also detected in the background well during the same sampling event and its presence is likely due to either artifacts of sampling or well installation.

Results from the risk assessment show that Site 3 does not present a threat to either human health or the environment based on risk quantification and on the lack of significant organic compounds in soil and groundwater.

3.0 Conclusions


Environmental sampling activities at Site 3 showed the absence of contamination associated with past use of the area. No petroleum-related compounds were detected in any of the 18 SOV, 13 soil or 5 groundwater samples collected over the investigation history. One semivolatile compound was detected in one soil sample and an unrelated semivolatile compound was detected in one groundwater sample. Each reported concentration was near to its respective quantitation limit. Risks evaluated for applicable and predicted exposure routes for chemicals detected in soil and groundwater indicate that Site 3 does not pose a threat to human health or the environment.

No current source area for potential contamination has been identified at Site 3. Based on the results of the SI and subsequent groundwater sampling, no hazardous materials or wastes have negatively impacted soil or groundwater.

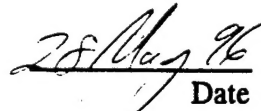
4.0 Recommendations

Based on investigation results, risk quantification and the lack of evidence that any hazardous materials or wastes have ever impacted Site 3 soil or groundwater, it is recommended that Site 3 be removed from any further investigation, sampling, or risk-based analytical activities.

The ANGRC has reviewed the available data and recommends no further action under the IRP at Site 3, Storage Area at the USMC Subleased Area, Fresno ANG Base.



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Civil Engineer Directorate



Date

5.0 References

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